Palestine. Nearly all the fishes are Cyprinids, mostly of the genus Barbus, which bear close affinity to Syrian types, as does also the recently discovered Loach (*Nemachilus abyssinicus*), so far the only known African representative of that Europæo-Asiatic group. The single species of the Cyprinid genus Varicorhinus is also suggestive of South-Western Asia, although a second African species inhabits Lake Tanganyika, and a third has lately been discovered in Morocco. Another Cyprinid genus, Discognathus, which is widely distributed over Southern Asia, from Syria and Aden to Burma, is represented by two species, whilst others are known from Abyssinia and East Africa (Gallaland, Kenya, and Kilimandjaro districts), and one each from the Nile and Lake Victoria. A remarkable negative feature is the absence, as in Syria, of Labeo, a genus abundantly represented in the Nile, Senegal, Niger, Congo, and Zambesi, and India, and more scantily in East and South Africa. It is a suggestive fact, tending to show that, somehow or other, Lake Tsana has only comparatively lately been in communication with the Nile, that the Varicorhinus and several of the Barbus are common to this lake and to some of the rivers of the eastern watershed; whilst not one of the Cyprinids occurs also in the Nile. The main stream of the Blue Nile has only been explored up to Rosaires, but the fishes obtained in that part of the river do not in any way differ from those of the Upper Nile.

The chief character of the rivers east of the Rift Valley is, as already stated, the number of species of Barbus. The Cyprinids are further represented by a few Labeo and Discognathus, by a Neobola, and by the only African representative of the Indo-Malay genus Rasbora. The Mormyrids are represented by six species only. The few Characinids belong to the genus Alestes and to its near allies Micralestes and Petersius. Of the twenty Silurids, some are widely distributed species, others are common to the Nile or to the Zambesi, whilst among the species with a restricted habitat we note a Physailia, two Bagrus, two Amphilius, a Synodontis, and two Chiloglanis—altogether a poor series as compared with other districts of Tropical Africa—and not a single autochthonous genus. A species of the remarkable genus Kneria, a few Cyprinodontids, and a few Cichlids of the genus Tilapia complete what is for a district of that extent, well watered and within the tropics, a very meagre list.

IV. The Southern Sub-region.

Africa south of the Zambesi system has a poor fresh-water fish-fauna, but this is easily accounted for by the intermittent character of most of its rivers. The list I have drawn up from available data includes only fifty species, seven of which are partly marine. When discussing the distribution of the South African fresh-water fishes eight years ago Prof. Max Weber compiled a list of sixty-four species; but this included a number of truly marine forms, occurring only in estuaries, besides a few of very doubtful determination, which I am obliged to leave out. The majority of the exclusively fresh-water fishes are Cyprinids, viz. seventeen Barbus and three Labeo. Characinids are represented by the widely distributed *Hydrocyon lineatus*, which occurs in the Limpopo, and the newly discovered *Alestes natalensis*, from near Durban. Three Clarias, an Eutropius, a Gephyroglanis, and a Galeichthys, the latter semi-marine, represent the Silurids. The two Galaxias, as distinguished by Castelnau, the most remarkable type of the South African fish-fauna, and the two Anabas, are confined to the south-western district of Cape Colony. A Cyprinodontid of the genus Fundulus has been described from False Bay. Four Gobies and five Cichlids of the genera Hemichromis, Paratilapia, and Tilapia complete the list.

Poor as it is in fishes, the south-western district—the *Erica or Protea district* of Max Weber—derives a special character from the presence of the genera Galaxias and Anabas. The western district is also poor, and has only representatives of three families: Cyprinids, Silurids, and Cichlids; whilst the eastern district, from the Limpopo system and the tributaries of the Orange River to Natal, is the richest, two families, Characinids and Gobiids, being represented, in addition to the three above named. The recent discovery in the Vaal River of a Gephyroglanis, a Silurid genus otherwise known only from the Congo and Ogowe, deserves notice.

Whether the subterranean reservoirs of the Kalahari are inhabited by fishes, as is the case in the Northern Sahara, is still unknown.

Excepting such forms as are believed to have been directly derived from marine types, there is every reason to regard the piscine inhabitants of the fresh waters of South Africa as comparatively recent immigrants from the North.

V. Madagascar.

It is extremely remarkable that this great island, which in most groups of animals shows so many striking features, should in its fish-fauna be one of the most insignificant districts in the whole world. For, if we exclude the numerous Grey Mullets and Gobies, and a few Perches of the genera Kuhlia and Ambassis, which live partly in the sea, and probably mostly breed in salt water, the truly fresh-water fish-fauna is reduced to sixteen species—viz., two Silurids, two Cyprinodontids, one Atherinid, four Cichlids, and seven Gobiids, the latter, no doubt, recent immigrants from the sea. The Silurids belong to two distinct genera, Læmonema, allied to the African Chrysichthys, first discovered in Mauritius, and Ancharius, allied to the marine or semi-marine Arius, and, perhaps, also entering the sea. Of the four Cichlids two belong to a very distinct autochthonous genus, Paretroplus, whilst the two others are respectively referred to the African genera Tilapia and Paratilapia. The two Cyprinodontids belong to the widely distributed genus Haplochilus.

In concluding this sketch, whilst looking back with satisfaction upon the rapid progress which African ichthyology has lately made, and expressing our gratitude to the Governments, institutions, and collectors to whom we owe this progress, we cannot abstain from pointing out how much remains to be done. All the great lakes are insufficiently explored, and Bangweolo has never been fished for scientific purposes, whilst within the limits of this colony an extensive collection from the Upper Zambesi is still a desideratum, and Lake Ngami is drying up without any of its fishes having been secured for study. The fishes of the Congo above Stanley Falls, and of many of its northern and all of its southern tributaries, are still unknown. But it is gratifying to observe the ever-growing interest in this hitherto somewhat neglected branch of zoology, and I may express the hope that the next decade will be productive of even greater results than have been achieved within the last.

NOTES.

We regret to see the announcement of the death of Prof. Jules Oppert, professor of Assyrian philology and archæology at the Collège de France, renowned for his contributions to astronomical chronology and his works on Chaldea and Assyria.

The Berlin correspondent of the *Times* announces the death, at seventy-six years of age, of Prof. Franz Reuleaux, who, as author of a number of engineering works and director of the Berlin Industrial Institute, rendered good service to the development of practical and scientific engineering in Germany.

New Orleans has been suffering from a serious outbreak of yellow fever, but there are now signs that the health authorities are getting the disease well in hand. Up to the end of last week, that is, a period of about four weeks, more than 1000 cases and 171 deaths had been recorded. It is believed that the fever was introduced into the city through fruit vessels arriving between June 1 and June 15 from Central America. All patients have been screened from mosquitoes, and there must now be little danger of infection from them.

The returns of births and deaths recently issued by the Registrar-General, while in some respects satisfactory, in one are of a disquieting nature. This is with reference to

the birth-rate, which during the last few years has steadily been declining, and has now reached the lowest figure on record, viz. 27·0 per 1000 for London and 29·2 per 1000 for seventy-five large towns. There must come a time, if this decline continues, when the deaths will exceed the births, and our population will decrease—a serious catastrophe for the nation. Were it not for a diminishing death-rate, particularly among infants, this contingency would already have come to pass. It is especially among the middle and upper classes that the birth-rate has declined, partly owing to selfishness and love of pleasure, but also partly due to the strenuousness of the conditions of modern life.

SIR J. CRICHTON-BROWNE delivered his presidential address to the conference of the Sanitary Inspectors' Association on August 17. He dealt with the problem of the sanatorium treatment of consumption, and expressed the opinion that splendid results had been obtained by it, and that Dr. Maudsley at the British Medical Association meeting (see NATURE, August 3, p. 331) had spoken too despondently about it, which was to be regretted, as it might tend to check a movement of great promise. He proceeded to consider the question of physical deterioration, and then dealt at length with the housing problem, and pointed out the advantages from a health point of view of country life as compared with town life. That the townsman was shorter lived than the countryman was, he said, incontrovertible.

THE relief ship *Terra Nova* returned to Tromso on August 10 with the members of the Ziegler North Polar Expedition on board. Mr. A. Fiala, the leader of the expedition, landed at Hull on Tuesday on his way to the United States, and gave a representative of Reuter's Agency an account of the experiences of the expedition. The *America,* with the members of the expedition on board, left Vardo on July 10, 1903. At the end of August the vessel reached Teplitz Bay, Crown Prince Rudolf Island, the most northerly harbour in Franz Josef Land, where magnetic and astronomical stations were erected. The ship was frozen in during October, and was wrecked by great ice pressure in the following month, so that the entire party had to be taken ashore on sledges. In January, 1904, during a gale, all the old ice in Teplitz Bay, with several miles of the glacier face, were broken and carried away, and with the bay ice disappeared all that was left of the *America*. Three attempts were made to reach the Pole by sledges, but the highest point attained was 82° 13′ north latitude. Mr. Fiala states that although the avowed purpose of the expedition—to reach the North Pole—was unsuccessful, the members have brought back data which should prove of scientific value, and have explored and surveyed the archipelago from Crown Prince Rudolf Land to Cape Flora, discovering four new channels and three large islands.

THE fifteenth International Congress of Americanists will be held at Quebec on September 10–15, 1906. The work of the congress will be concerned with the indigenous races of America, their origin, geographical distribution, history, physical characters, languages, civilisation, mythology, religion, manners, and customs; indigenous monuments and archæology of America; history of the discovery and European occupation of the New World. The president of the committee of organisation of the congress is Dr. Robert Bell, F.R.S., director of the Geological Survey of Canada, and the general secretary is Dr. N. E. Dionne, Quebec, Canada.

TRIALS of a system of signalling by bells under water, which has been developed by the Submarine Signalling Company, of Boston, U.S.A., were made by the Trinity House authorities on August 11. This invention, which was described in NATURE of April 20 (vol. lxxi. p. 595), has been used experimentally by the United States Lighthouse Board at several of their light stations during the past few years; it has also been adopted by the Canadian Government as an aid to navigation in the St. Lawrence. For the purpose of these trials the North Goodwin lightship was fitted with a submarine bell, and the Trinity steamship *Irene* with the necessary sound-receiving apparatus. At distances of from three to five miles the signals given by the bell were distinctly heard, and the direction whence they emanated could be readily noted.

MR. C. R. CROSBY has favoured us with a copy of a catalogue of the North American spiders of the group Erigoneæ, contributed by him to the *Proceedings of the Philadelphia Academy*.

THE fourth and final part of vol. xxv. of *Notes from the Leyden Museum* contains, among other papers, the concluding portion of the preliminary description, by Miss C. M. L. Popta, of new fishes collected in Borneo by Dr. Nieuwenhuis, and likewise one by Dr. Lidth de Jeudi on new Bornean lizards.

WE have received the report of the Trivandrum Museum and Public Gardens for 1903–4, which is signed by the new director, Major F. W. Dawson. In addition to statements in regard to the condition and progress of the establishment, some interesting details are given with regard to the amount of food consumed by some of the reptiles in the gardens; and Mr. Lydekker's paper, in the *Journal of the Bombay Natural History Society,* on certain dolphins recently taken on the Travancore coast is reproduced in full.

THE report of the Field Columbian Museum, Chicago, for the period 1903–4 contains reproductions from photographs of some of the chief objects of interest added during the year. The wide scope of the exhibits, and the beauty and thoroughness of the installation, are very noteworthy. Among the exhibits special reference may be made to one of a group of wild duck being stalked by a lynx, and to a second illustrating the ingredients entering into the composition of curry-powder. In the latter no less than thirty-one trays of distinct specimens are shown.

IN the course of last week's notes, reference was made (p. 385) to the web-making ants of the genus Œcophylla. In the latest issue (August 1) of *Biologisches Centralblatt* Dr. F. Doflein gives a detailed description of the habits of *Œ. smaragdina,* a species widely distributed in the Oriental region, accompanied by original sketches of the ants and their larvæ at work. When the edges of a leaf are to be joined, or when a rift appears in the nest, a small company of the workers place themselves in a line across the fissure, holding on to the one edge with their mandibles and to the other with their legs, which are stretched backwards to their furthest extent, and then with a united pull drag the two edges into contact. A second party then comes, and trims and fits the edges until they meet exactly, while finally comes a third party, each member of which carries a larva in its jaws. The larvæ, being put to work, immediately spin a "criss-cross" web by means of which the two edges of the leaf are firmly united.—In another paper in the same issue Mr. F. E. Zierler, of Dorpat, discusses the molar dentition of the fossil Suidæ in connection with their phylogeny. Apparently the author makes no reference to the theory that the crown-structure of the suilline molar is a degradation from the selenodont type.

AN interesting contribution to the history of the steam-engine is published in the *Engineer* of August 11 in the form of particulars of some old prints unearthed at the British Museum. One of the most interesting of these, engraved by Sutton Nicholls and bearing the date 1725, is that illustrated in the accompanying figure, reduced from one of the illustrations in our contemporary. The engraved part measures 13¾ inches by 12¾ inches, and on either side in letterpress appears a detailed description. The print is believed to be unique, and in point of date is second only in importance to the Dudley Castle steam-engine print of 1712, preserved in the Birmingham Free Library. It resembles the drawings of the Newcomen engine at the colliery at Griff, in Warwickshire, erected in 1722. Several changes in the mechanical details from the Dudley Castle engine may be noted. The boiler is fed with a portion of the hot water coming from the bottom of the cylinder, so that a date is fixed for this advance in economy. There are also two gauge-cocks instead of one, so that both high and low water would be indicated. Reproductions are also given in the same article of copper plates of the Newcomen engine erected at Passy, near

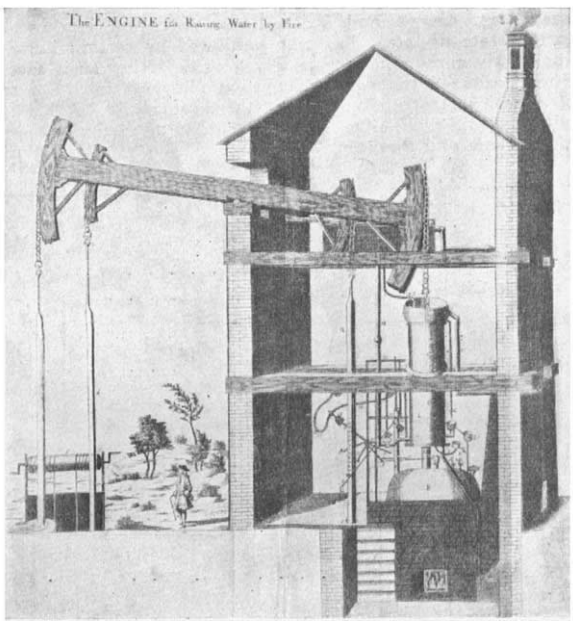

FIG. 1.—A mospheric Steam Engine, 1725 From the *Engineer*.

Paris, in 1726, which was copied from that at Griff Colliery. The first Newcomen engine on the Continent was, however, that put down in 1722 at Cassel by Joseph Emanuel Fischer von Erlach, who ordered at the same time in England a similar engine for draining a mine at Königsberg, in Hungary. This was completed in 1724 by one Isaac Potter from Durham, who was in consequence looked upon as the inventor.

THE *Journal of the Röntgen Society* for July (ii., No. 5) contains reports of meetings of the society and of the Röntgen Congress at Berlin, and various papers, notes, &c., as well as three plates of excellent radiograms and a portrait of the president, Mr. Wilson Noble.

THE *Journal of the Royal Sanitary Institute* for August (xxvi., No. 7) contains a valuable discussion on sanatoria for consumptives, opened by Mr. Edwin T. Hall, and an interesting paper by Dr. Rideal on the sterilisation of sewage effluents, with special reference to oysters and other shell-fish, and to watercress beds.

WE have received a copy of Messrs. Merck's annual report for 1904 on the advancements of pharmaceutical chemistry and therapeutics during that year. It contains a wealth of information, and should be in the hands of every medical practitioner and pharmaceutical chemist who wishes to keep abreast of modern work and progress.

THE Annual Report and Transactions of the Manchester Microscopical Society for 1904 has just reached us. The society is evidently in a flourishing condition, and several of the contributed papers are of interest, particularly those by Prof. Hickson, the president, on micro-organisms associated with disease, and by Mr. Gillanders on arboreal insects, with two illustrative plates.

WITH reference to a note on the Leishman-Donovan body or parasite which appeared in these columns (June 15, p. 157), Lieut. Christophers, I.M.S., writes pointing out that his researches on the development of flagellated forms antedated those of Leishman, but that Capt. Rogers, I.M.S., was the first discoverer of the metamorphosis. The latter fact was noted in NATURE (vol. lxx. p. 534).

PROF. F. RAMALEY contributes an account of the examination of certain foliaceous cotyledons to the *University of Colorado Studies* (vol. ii., part iv.). The anatomical structure of the cotyledons of several species of tropical plants was examined for comparison with the structure of the ordinary leaves.

A SIMPLE piece of apparatus, called a pinometer, for connecting both ends of a plant, cut as for a root-pressure experiment, has been devised and is described by Dr. O. V. Darbishire in the *Botanical Gazette* (May). The object of the pinometer, which is well adapted to ordinary class work, is to enable the experimentalist to study at one time both the suction force of transpiration and root-pressure. For research purposes the author is elaborating a more complex and precise form of the instrument.

SIR JOSEPH HOOKER continues his epitome of the British Indian species of Impatiens in No. 2, vol. iv., of the *Records of the Botanical Survey of India*. This includes a list of eastern Himalayan plants, of which the chief centre is Sikkim, and fifty species from Burma of which three-quarters are endemic. In addition to the new species which, as Sir Joseph Hooker expects, still await discovery in Sikkim and Burma, there is great need for collecting better material, more especially good specimens of the flowers and of separate parts of the flowers.

THE *Trinidad Bulletin* for July contains an account of the results obtained during the first year in manurial experiments with cacao plants on the Brasso Estate. Mr. E. H. Cunningham-Craig contributes some geological notes on soils in Trinidad to serve as an explanation of the geological maps that have been produced, and also to furnish a guide to cacao planters of the value and probable manurial requirements of the various soils. Mr. C. W. Meaden has an article on parasites in cattle and poultry, giving a detailed account of the parasite *Strongylus micrurus*, with remarks on the methods of treatment. A report on various rubber plantations in the island is presented by Mr. W. Leslie.

MESSRS. R. AND J. BECK, LTD., have sent us a dark screen mounted in a convenient way for use in viewing the eclipse of the sun on August 30. If the sky is clear, a smoked or very dark glass will enable the progress of the partial eclipse to be followed in any part of our islands.